

REMARKS

Applicant thanks the Examiner for the attention accorded the present Application in the December 6, 2002 Office Action, in which claims 1-34 were pending. In that Action, claims 1-5, 9, 10, 12, 15-19, 22 and 23 were rejected under 35 U.S.C. § 102(b) as being anticipated by Sullivan; claims 6, 14 and 24-26 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sullivan and further in view of Awad; claims 7-8 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sullivan and further in view of Awad and Matsuno; claims 10-11 and 20-21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sullivan; and claims 27-34 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sullivan and further in view of Grunwald.

By the foregoing amendments, claims 1, 6, 16, 23, 24 and 27 have been amended to more clearly specify the present invention. No new matter has been added, and the amendments and new claims are fully supported throughout the specification, as more fully described below.

Claims 1-34 are now currently pending in this Application. Based on the above amendments, Applicants respectfully submit that the rejections to claims 1-34 have been overcome. Reconsideration of this Application, and allowance of pending claims 1-34, is respectfully requested in view of the foregoing amendments and the following remarks.

35 U.S.C. § 102(b) rejections

Claims 1-5, 9, 10, 12, 15-19, 22 and 23 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Sullivan. Applicants respectfully disagree with the Examiner's conclusion and submit that the present invention is not anticipated, nor even suggested, by Sullivan.

As presently claimed in Applicants' independent claims, Applicants' invention comprises "[a] method for removing an oxide material from a surface of a substrate or a coating disposed on the substrate ... [by utilizing] an acid having the formula H_xAF_6 , or precursors to said acid, wherein A is selected from the group consisting of Si, Ge, Ti, and

Ga; and x is 1-6.”¹ In fact, all of Applicants’ independent claims utilize “an acid having the formula H_xAF_6 , or precursors to said acid, wherein A is selected from the group consisting of Si, Ge, Ti, and Ga; and x is 1-6.”²

In contrast, Sullivan does not disclose removing an oxide material or a coating from a surface of a substrate using an acid having the formula H_xAF_6 , or precursors to said acid, wherein A is selected from the group consisting of Si, Ge, Ti, and Ga; and x is 1-6. Sullivan discloses using sulfuric acid (H_2SO_4) and a soluble fluorine-containing species, which essentially generates hydrogen fluoride (hydrofluoric acid) in situ.³ This is in contrast to Applicants’ invention which uses acids that do not produce fluoride in the mixture. Therefore, Sullivan does not anticipate, nor even suggest, utilizing any of the acids recited in independent claims 1, 23, 24 and 27 of Applicants’ invention.)①

Based on the above arguments, Applicants respectfully submit that independent claims 1 and 23 of the present invention are patentably distinguished from Sullivan. As claims 2-5, 9, 10, 12, 15-19 and 22 depend from claim 1, the discussion above applies to these claims as well. Further, these claims each include separate novel features. Thus, Applicants respectfully request allowance of pending claims 1-5, 9, 10, 12, 15-19, 22 and 23.

35 U.S.C. § 103(a) rejections

1. Rejection of claims 6, 14 and 24-26

Claims 6, 14 and 24-26 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Sullivan in view of Awad. Applicants respectfully disagree with the Examiner’s conclusion and submit that the present invention is not obvious in view of, nor is it even suggested by, Sullivan and/or Awad.

As previously discussed above, and as presently claimed in Applicants’ independent claims 1 and 24, Applicants’ invention comprises a method for removing an oxide material or a coating from a surface of a substrate using an acid having the formula

¹ Applicants’ spec., independent claim 1 (emphasis added).

² Applicants’ spec., independent claims 1, 23, 24 and 27 (emphasis added).

³ Sullivan, pg. 2, lines 23-55.

H_xAF_6 , or precursors to said acid, wherein A is selected from the group consisting of Si, Ge, Ti, and Ga; and x is 1-6.⁴

In contrast, and as also previously discussed above, Sullivan does not disclose removing an oxide material or a coating from a surface of a substrate using an acid having the formula H_xAF_6 , or precursors to said acid, wherein A is selected from the group consisting of Si, Ge, Ti, and Ga; and x is 1-6.

Awad fails to cure the deficiencies of Sullivan. Awad does not disclose removing an oxide material or a coating from a surface of a substrate using an acid having the formula H_xAF_6 , or precursors to said acid, wherein A is selected from the group consisting of Si, Ge, Ti, and Ga; and x is 1-6 either. Awad discloses a *multistep* chemical treatment to *condition* a metal surface,⁵ not a *single step removal* process as claimed in Applicants' invention. Thus, Awad does not disclose, nor even suggest, removing an oxide material or a coating from a surface of a substrate using an acid as recited in independent claims 1 and 24 of Applicants' invention.

Based on the above arguments and amendments, Applicants respectfully submit that independent claims 1 and 24 of the present invention are patentably distinguished from Sullivan and Awad. As claims 6 and 14 depend from claim 1, and claims 25-26 depend from claim 24, the discussion above applies to these claims as well. Further, these claims each include separate novel features. Thus, Applicants respectfully request allowance of pending claims 6, 14 and 24-26.

2. Rejection of claims 7-8

Claims 7-8 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Sullivan in view of Awad and Matsuno. Applicants respectfully disagree with the Examiner's conclusion and submit that the present invention is not obvious in view of, nor is it even suggested by, Sullivan, Awad and/or Matsuno.

As previously discussed above, and as presently claimed in Applicants' independent claim 1, Applicants' invention comprises a method for removing an oxide material or a coating from a surface of a substrate using an acid having the formula

⁴ Applicant's spec., independent claims 1 and 24.

⁵ Awad, col. 1, line 56 to col. 2, line 56 (emphasis added).

H_xAF_6 , or precursors to said acid, wherein A is selected from the group consisting of Si, Ge, Ti, and Ga; and x is 1-6.⁶

In contrast, and as also previously above, Sullivan and Awad do not disclose removing an oxide material or a coating from a surface of a substrate using an acid having the formula H_xAF_6 , or precursors to said acid, wherein A is selected from the group consisting of Si, Ge, Ti, and Ga; and x is 1-6.

Matsuno fails to cure the deficiencies of Sullivan and Awad. Matsuno does not disclose removing an oxide material or a coating from a surface of a substrate using an acid having the formula H_xAF_6 , or precursors to said acid, wherein A is selected from the group consisting of Si, Ge, Ti, and Ga; and x is 1-6 either. Matsuno discloses utilizing hydrofluoric acid generated by acidifying fluoride to treat semiconductors.⁷ This is in contrast to Applicants' invention which uses acids that do not produce fluoride in the mixture. Thus, Matsuno does not disclose, nor even suggest, removing an oxide material or a coating from a surface of a substrate using an acid as recited in independent claim 1 of Applicants' invention. (2)

Based on the above arguments and amendments, Applicants respectfully submit that independent claim 1 of the present invention is patentably distinguished from Sullivan, Awad and Matsuno. As claims 7-8 depend from claim 1, the discussion above applies to these claims as well. Further, these claims each include separate novel features. Thus, Applicants respectfully request allowance of pending claims 7-8.

3. Rejection of claims 10-11 and 20-21

Claims 10-11 and 20-21 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Sullivan. Applicants respectfully disagree with the Examiner's conclusion and submit that the present invention is not obvious in view of, nor is it even suggested by, Sullivan.

As previously discussed above, and as presently claimed in Applicants' independent claim 1, Applicants' invention comprises a method for removing an oxide material or a coating from a surface of a substrate using an acid having the formula

⁶ Applicant's spec., independent claim 1.

⁷ Matsuno, col. 4, line 59 to col. 5, line 30.

H_xAF_6 , or precursors to said acid, wherein A is selected from the group consisting of Si, Ge, Ti, Al, and Ga; and x is 1-6.⁸

In contrast, and as also previously discussed above, Sullivan does not disclose removing an oxide material or a coating from a surface of a substrate using an acid having the formula H_xAF_6 , or precursors to said acid, wherein A is selected from the group consisting of Si, Ge, Ti, and Ga; and x is 1-6. (14)

Based on the above arguments and amendments, Applicants respectfully submit that independent claim 1 of the present invention is patentably distinguished from Sullivan. As claims 10-11 and 20-21 depend from claim 1, the discussion above applies to these claims as well. Further, these claims each include separate novel features. Thus, Applicants respectfully request allowance of pending claims 10-11 and 20-21.

4. Rejection of claims 27-34

Claims 27-34 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Sullivan in view of Grunwald. Applicants respectfully disagree with the Examiner's conclusion and submit that the present invention is not obvious in view of, nor is it even suggested by, Sullivan and/or Grunwald.

As previously discussed above, and as presently claimed in Applicants' independent claims 1 and 27, Applicants' invention comprises a method for removing an oxide material or a coating from a surface of a substrate using an acid having the formula H_xAF_6 , or precursors to said acid, wherein A is selected from the group consisting of Si, Ge, Ti, and Ga; and x is 1-6.⁹

In contrast, and as also previously discussed above, Sullivan does not disclose removing an oxide material or a coating from a surface of a substrate using an acid having the formula H_xAF_6 , or precursors to said acid, wherein A is selected from the group consisting of Si, Ge, Ti, and Ga; and x is 1-6.

Grunwald fails to cure the deficiencies of Sullivan. Grunwald does not disclose removing an oxide material or a coating from a surface of a substrate using an acid having the formula H_xAF_6 , or precursors to said acid, wherein A is selected from the (15)

⁸ Applicant's spec., independent claim 1.

⁹ Applicant's spec., independent claims 1 and 27.

group consisting of Si, Ge, Ti, and Ga; and x is 1-6 either. Grunwald discloses a method to de-smut an aluminum surface using a dry persulfate treatment.¹⁰ Applicants' invention is not de-smutting anything. Thus, Grunwald does not disclose, nor even suggest, removing an oxide material or a coating from a surface of a substrate using an acid as recited in independent claims 1 and 27 of Applicants' invention.

Based on the above arguments and amendments, Applicants respectfully submit that independent claims 1 and 27 of the present invention are patentably distinguished from Sullivan and Grunwald. As claims 28-33 depend from claim 27, and claim 34 depends from claim 1, the discussion above applies to these claims as well. Further, these claims each include separate novel features. Thus, Applicants respectfully request allowance of pending claims 27-34.

CONCLUSION

Applicants respectfully submit that the amendments to the claims, and the arguments made above, successfully traverse the rejections given by the Examiner in this Office Action. For the above reasons, it is respectfully submitted that the claims now pending patentably distinguish the present invention from the cited references. Allowance of pending claims 1-34 is therefore respectfully requested.

As this reply is being timely filed within 2 months of the mailing date of the Final Office Action, Applicants believes that there is no fee due for the filing of this response. If this is incorrect, however, the Commissioner is authorized to charge any additional fees that may be due, or credit any overpayment, to **Deposit Account Number 04-1448**.

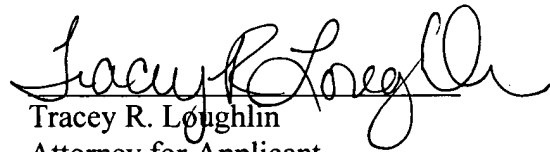
Should the Examiner have any questions, or determine that any further action is necessary to place this Application into better form for allowance, the Examiner is encouraged to telephone the undersigned representative at the number listed below.

¹⁰ Grunwald, Title of Invention.

Date: 02/06/03

Dougherty, Clements & Hofer
1901 Roxborough Road, Suite 300
Charlotte, NC 28211
704-366-6642 Telephone
704-366-9744 Facsimile

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Tracey R. Loughlin". The signature is written in dark ink and is positioned above the printed name and title.

Tracey R. Loughlin
Attorney for Applicant
Registration No. 51,969

VERSION WITH MARKINGS TO SHOW CHANGES MADE

Amendments in the Claims:

In accordance with 37 C.F.R. § 1.121(c)(1), the following replacement claims show all of the changes made by the foregoing amendments relative to the previous versions of the claims. Material added is shown underlined, material deleted is shown in [brackets].

1. (Twice Amended) A method for removing an oxide material from a surface of a substrate or a coating disposed on the substrate, comprising the step of contacting the oxide material with an aqueous composition which comprises an acid having the formula H_xAF_6 , or precursors to said acid, wherein A is selected from the group consisting of Si, Ge, Ti, [Zr, Al,] and Ga; and x is 1-6.
6. (Amended) The method of claim 1, wherein the aqueous composition comprises the compound H_2SiF_6 [, H_2ZrF_6 , or mixtures thereof].
16. (Amended) The method of claim 15, wherein the additional acid is present at a level within [in] the range of about 20 mole % to about 70 mole %.
23. (Twice Amended) A method for removing a coating and an oxide material from a substrate, comprising the step of exposing the substrate to an aqueous composition under conditions sufficient to remove substantially all of the oxide material and substantially all of the coating, wherein the aqueous composition comprises an acid having the formula H_xAF_6 , or precursors to said acid, wherein A is selected from the group consisting of Si, Ge, Ti, [Zr, Al,] and Ga; and x is 1-6, and wherein the precursors to said acid comprise any compound or group of compounds which can be combined to form the acid or its dianion AF_6^{2-} under reactive conditions.
24. (Amended) A method for removing an oxide material from a diffusion- or overlay coating on the surface of a turbine engine component, comprising the step of

contacting the oxide material with an aqueous composition which comprises H_2SiF_6 [or H_2ZrF_6 , or mixtures thereof].

27. (Amended) A method for replacing a worn or damaged protective coating applied over a substrate, comprising the following steps:

(i) removing an oxide material from the surface of a coating disposed on the substrate, by contacting the oxide material with an aqueous composition which comprises an acid having the formula H_xAF_6 , or precursors to said acid, wherein A is selected from the group consisting of Si, Ge, Ti, [Zr, Al,] and Ga; and x is 1-6;

(ii) removing the coating disposed on the substrate, by contacting the coating with an aqueous composition which comprises an acid having the formula H_xAF_6 , or precursors to said acid, wherein A is selected from the group consisting of Si, Ge, Ti, [Zr, Al,] and Ga; and x is 1-6; and then

(iii) applying a new coating to the substrate.